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MONITORING OF REMOVAL OF ORGANOCHLORINE / FLUORINE PESTICIDES FROM WATER USING GRAPHENE COMPOSITES BY GAS CHROMATOGRAPHY /MASS SPECTROMETRY

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Three nanoparticles' materials are prepared, characterized and their performance was evaluated for efficient removal of five organochlorine, one organofluorine and six different kinds of bacteria. Gas chromatography/mass spectroscopy has been used to monitor the pesticides concentration before and after treatment by these prepared materials. Graphene gives the most efficient removal of these pesticides than graphene-silver composite but the later is more efficient for remediation of water contaminated with different kinds of bacteria.

Keywords: graphene oxide, thermally reduced graphene, graphene-silver nanoparticles, composites, organochlorine, organofluorine pesticides, gas chromatography/mass spectroscopy.

Introduction

In both developing and industrialized nations, the surge of industrial, agricultural and domestic activities has inevitably resulted in an increased flux of toxic pollutants in the surrounding water bodies [1]. Freshwater can be contaminated with a myriad of pollutants ranging from potentially toxic elements (PTE), dyes, phenolic compounds, pesticides, and herbicides to emerging micropollutants such as endocrine disrupting compounds (EDC), pharmaceuticals, personal care products (PPCP) and nitrosamines [2, 3]. One of these pollutants is organochlorine pesticides (OCP), a group of highly efficient broad spectrum pesticides that are extensively used in agriculture, industry, and even to control diseases such as malaria. OCP are notorious for their toxicity due to the capacity for bioaccumulation; their environmental contamination has become a major concern because of their persistence, long distance transport, biological effects, and bioaccumulation along the food

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Received 26.04.2015